

PCTWORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁷ : C11D 3/30	A1	(11) International Publication Number: WO 00/63333 (43) International Publication Date: 26 October 2000 (26.10.00)
(21) International Application Number: PCT/US00/10385 (22) International Filing Date: 18 April 2000 (18.04.00) (30) Priority Data: 60/129,949 19 April 1999 (19.04.99) US (71) Applicant (for all designated States except US): THE PROCTER & GAMBLE COMPANY [US/US]; One Procter & Gamble Plaza, Cincinnati, OH 45202 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): GODFROID, Robert, Allen [US/US]; 5309 Whispering Woods Drive, West Chester, OH 45069 (US). POLICICCHIO, Nicola, John [CA/US]; 4976 Laurelwood Court, Mason, OH 45040 (US). DUSING, Michael, William [US/US]; 49 Lake Avenue, Louisville, KY 40206 (US). WILLMAN, Kenneth, William [US/US]; 5603 Williamsburg Way, Fairfield, OH 45014 (US). BINSKI, Christopher, James [US/US]; Apartment 106, 4874 Hunt Road, Cincinnati, OH 45242 (US). (74) Agents: REED, T., David et al.; The Procter & Gamble Company, 5299 Spring Grove Avenue, Cincinnati, OH 45217-1087 (US).		(81) Designated States: AE, AL, AM, AT, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), DM, EE, EE (Utility model), ES, FI, FI (Utility model), GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i>
(54) Title: DETERGENT COMPOSITION COMPRISING ANTI-HAZING AGENT (57) Abstract A hard surface detergent composition contains an effective amount of anti-hazing agent, and a detergent surfactant, and the pH preferably being above about 8. The detergent composition cleaning solution is preferably suitable for use with a disposable cleaning pad, more preferably comprising an effective amount of a superabsorbent material, the pad preferably being part of a cleaning implement comprising a handle and said cleaning pad preferably being removable. The process of using the detergent composition with such a cleaning pad, and the provision of a kit containing both detergent composition and cleaning pad are disclosed.		

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece			TR	Turkey
BG	Bulgaria	HU	Hungary	ML	Mali	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MN	Mongolia	UA	Ukraine
BR	Brazil	IL	Israel	MR	Mauritania	UG	Uganda
BY	Belarus	IS	Iceland	MW	Malawi	US	United States of America
CA	Canada	IT	Italy	MX	Mexico	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NE	Niger	VN	Viet Nam
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NO	Norway	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	NZ	New Zealand		
CM	Cameroon			PL	Poland		
CN	China	KR	Republic of Korea	PT	Portugal		
CU	Cuba	KZ	Kazakstan	RO	Romania		
CZ	Czech Republic	LC	Saint Lucia	RU	Russian Federation		
DE	Germany	LJ	Liechtenstein	SD	Sudan		
DK	Denmark	LK	Sri Lanka	SE	Sweden		
EE	Estonia	LR	Liberia	SG	Singapore		

DETERGENT COMPOSITION COMPRISING ANTI-HAZING AGENT

5

TECHNICAL FIELD

This application relates to detergent compositions containing an anti-hazing agent. The detergent composition cleaning solution is also preferably suitable for use with a disposable cleaning pad. This application also relates to a process of using the detergent composition with such a cleaning pad, and the provision of a kit containing the detergent composition and cleaning pad are disclosed.

BACKGROUND OF THE INVENTION

The developer and formulator of surfactants for hard surface cleaning must consider a wide variety of possibilities with limited (sometimes inconsistent) information, and then strive to provide overall improvements in one or more of a whole array of criteria, including performance in the presence of free calcium and a wide variety of soils, in complex mixtures of surfactants and polymers, e.g. cationic polymers, formulation changes, enzymes, various changes in consumer habits and practices, and the need for biodegradability.

One problem associated with hard surface cleaning compositions is the hazing of a surface after cleaning. This hazing is often associated by the consumer with residual soil, or unremoved stains. The hazing is usually the result of solution components combining with visible residues of any unremoved soil. These residues, when dried on a hard surface, such as a floor, can refract light instead of reflecting it and diminish the appearance of the surface. When haze is present after cleaning the consumer perception is that more product should be used or that the product does not work.

Consequently, there remains the need for a hard surface cleaning composition suitable for providing grease and particulate soil removal which upon drying on a surface minimizes or totally eliminates haze.

SUMMARY OF THE INVENTION

5 It has now been determined that the use of certain anti-hazing agents, as outlined in detail below, in combination with at least one surfactant in a specific ratio range and pH provide a composition which upon drying does reduce haze.

In accordance with a first aspect of the present invention a hard surface detergent composition is provided that comprises: an effective amount of anti-hazing agent, preferably from about 0.001% to about 5%, more preferably from about 0.001% to about 2%, by weight of the composition of anti-hazing agent. The anti-hazing agent being selected from the group consisting of organic diamine, having molecular weight of from greater than 61 g/mol to less than or equal to 400 g/mol, organic triamine having molecular weight less than or equal to 500 g/mol, organic tetramine having molecular weight less than or equal to 600 g/mol, and mixtures thereof, and wherein the anti-hazing agent has a pKa of at least about 8; and an effective amount, preferably from about 0.005% to about 0.5%, more preferably from about 0.01% to about 0.2% by weight of the composition of one or more detergent surfactants; wherein the weight ratio of the anti-hazing agent to the surfactants is from about 40:1 to about 1:5, preferably from about 15:1 to about 1:5, more preferably from about 11:1 to about 1:5; and said composition has a pH greater than about 8, preferably greater than 9, more preferably from 9.5 to 12.5, more preferably from about 9.5 to about 11.7.

In accordance with a second aspect of the present invention a process of cleaning a surface comprises the step of applying an effective amount of the detergent composition according to the first aspect to said surface and, optionally, but preferably, absorbing the composition in an absorbent structure preferably comprising a superabsorbent material.

In accordance with a third aspect of the present invention a kit comprises an implement containing disposable cleaning pad containing superabsorbent material and detergent composition that provides effective cleaning and good filming/streaking, that is reduces hazing, when used with said disposable cleaning pad, optionally, but preferably, without rinsing, said composition according to the first aspect comprising an effective

amount of anti-hazing agent. The anti-hazing agent being selected from the group consisting of organic diamine, having molecular weight of from greater than 61 g/mol to less than or equal to 400 g/mol, organic triamines having molecular weight less than or equal to 500 g/mol, organic tetramines having molecular weight less than or equal to 600 g/mol, and mixtures thereof, the anti-hazing agent having a pKa of at least about 8; and an effective amount of one or more detergent surfactants; wherein the weight ratio of said anti-hazing agent to said surfactants is from about 40:1 to about 1:5, preferably from about 15:1 to about 1:5, more preferably from about 11:1 to about 1:5; and said composition has a pH greater than about 8, preferably greater than 9, more preferably from 9.5 to 12.5, more preferably from about 9.5 to about 11.7.

The invention in a fourth aspect also comprises a detergent composition as disclosed herein in a container in association with instructions to use it with an implement comprising a disposable pad, preferably a disposable pad comprising an effective amount of a superabsorbent material, and, optionally, said container is in a kit comprising disposable pad and, optionally, the remainder of said implement, or, at least, a disposable cleaning pad comprising a superabsorbent material. The invention also relates in a preferred fifth aspect to the use of the composition and a cleaning pad comprising a superabsorbent material (superabsorbent pad) to effect cleaning of soiled surfaces.

Accordingly, it is an aspect of the present invention to provide novel cleaning compositions; methods of using these novel compositions; kits containing these novel compositions; methods of using these novel compositions/ and these novel compositions packaged with instructions for using them in a way that provides unique benefits to the consumer. These, and other, aspects, features and advantages will be clear from the following detailed description and the appended claims.

In the description of the invention various embodiments and/or individual features are disclosed. As will be apparent for the skilled practitioner all combinations of such embodiments and features are possible and can result in preferred executions of the invention.

All parts, percentages and ratios used herein are by weight unless otherwise specified. All documents cited are, in relevant part, incorporated herein by reference.

DETAILED DESCRIPTION

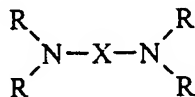
The present invention relates to hard surface cleaning applications (HSC). HSC compositions are different from other similar cleaning compositions, such as LDL's or laundry compositions, in that they are typically used neat or pre-diluted, low suds (unlike LDL's), non-rinse, higher pH. Furthermore, HSC compositions are designed to be applied to much larger surfaces, than other cleaning compositions, such as counter tops, and floors. They are also applied to a wide variety of both synthetic and natural surfaces, such as marble, slate, vinyl, linoleum, granite, Formica, aluminum, stainless steel and the like.

Anti-hazing agent

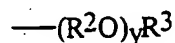
The anti-hazing agent of the present invention is selected from the group consisting of organic diamines, having molecular weights of from greater than 61 g/mol to less than or equal to about 400 g/mol; organic triamines having molecular weight less than or equal to about 500 g/mol; organic tetramines having molecular weight less than or equal to about 600 g/mol; and mixtures thereof, and wherein said anti-hazing agent has a pKa of at least about 8.

As a working definition herein, the pKa of the anti-hazing agent is specified in an all-aqueous solution at 25°C and for an ionic strength between 0.1 to 0.5 M. The pKa is an equilibrium constant which can change with temperature and ionic strength; thus, values reported in the literature are sometimes not in agreement depending on the measurement method and conditions. To eliminate ambiguity, the relevant conditions and/or references used for pKa's of this invention are as defined herein or in "Critical Stability Constants: Volume 2, Amines". One typical method of measurement is the potentiometric titration of the acid with sodium hydroxide and determination of the pKa by suitable methods as described and referenced in "The Chemist's Ready Reference Handbook" by Shugar and Dean, McGraw Hill, NY, 1990.

It is preferred that when the anti-hazing agent is an organic diamine it has the formula:

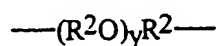


wherein each R is independently selected from the group consisting of hydrogen, C₁-C₄ linear or branched alkyl, alkyleneoxy having the formula:



wherein R² is C₂-C₄ linear or branched alkylene, and mixtures thereof; R³ is hydrogen, C₁-C₄ alkyl, and mixtures thereof; y is from 1 to about 10; X is a unit selected from:

i) C₂-C₁₀ linear alkylene, C₃-C₁₀ branched alkylene, C₃-C₁₀ cyclic alkylene, C₃-C₁₀ branched cyclic alkylene, an alkyleneoxyalkylene having the formula:



wherein R² and y are the same as defined herein above;

ii) C₃-C₁₀ linear, C₃-C₁₀ branched linear, C₃-C₁₀ cyclic, C₃-C₁₀ branched cyclic alkylene, C₆-C₁₀ arylene, wherein said unit comprises one or more electron donating or electron withdrawing moieties which provide said diamine with a pK_a greater than about 8; and

iii) mixtures of (i) and (ii).

More preferably the anti-hazing agent is selected from the group consisting of 1,3-bis(amino methyl)-cyclohexane(also known as 1, 3 cyclohexaneBis(methylamine) or 1, 3 BAC), N-cyclohexyl-1,3-propanediamine, 1,2-diaminocyclohexane, 1, 3 cyclohexane Bis[tetra(hydroxypropyl)-methylamine], 1,3 benzene dimethanamine, N-phenylethylene diamine, 1,3 bis[tris(hydroxymethyl)-methylamino]propane, N,N,N',N'tetrakis(2-hydroxypropyl)ethylenediamine, N,N'-bis(bishydroxypropyl)ethylene diamine, N,N'-bis(bishydroxyethyl)ethylene diamine, N,N',N'tetrakis(2-hydroxyethyl)ethylenediamine, 1,3, Bis[tris(hydroxymethyl)methylamino]propane, 1,3 benzene dimethanamine, and mixtures thereof. Even more preferably the anti-hazing agent is 1,3-bis(amino methyl)-cyclohexane, N,N,N',N'tetrakis(2-hydroxypropyl)ethylenediamine, N,N',N'tetrakis(2-hydroxyethyl)ethylenediamine, N,N,N',N'tetrakis(2-hydroxypropyl)ethylenediamine, N,N'-bis(bishydroxypropyl)ethylene diamine, N,N'-bis(bishydroxyethyl)ethylene diamine, 1,3 benzene dimethanamine and mixtures thereof.

The anti-hazing agent can provide additional functions and/or benefits. The preferred anti-hazing agents provide alkalinity, especially to provide a pH of greater than about 8, preferably greater than about 9, and more preferably from about 9.5 to about

12.5, even more preferably from about 9.5 to about 11.7 to improve cleaning, stabilize the formula, and/or neutralize anionic materials like surfactants and carboxylate polymers that are present. The preferred anti-hazing agents, for example, 1,3-bis(amino methyl)-cyclohexane, in addition to providing improved cleaning and product stability help reduce the incidence of, or severity of marks on the floor after cleaning the surface with a composition according to the present invention. In addition, the preferred amines have surprisingly low odor compared to other amines, which allow them to be used at relatively higher levels in compositions while maintaining consumer-acceptable odor characteristics in the finished product. These extra benefits can be brought to the attention of consumers by adding instructions as pointed out herein after.

Surfactant

The compositions of the present invention contain one or more detergent surfactants. It is preferred that these surfactants are selected from the group consisting of anionic, nonionic, zwitterionic, cationic, amphoteric and mixtures thereof, more preferably the detergent surfactant has a linear or branched structure and is selected from the group consisting of anionic and nonionic detergent surfactants. even more preferably anionic and nonionic detergent surfactants having hydrophobic chains containing from about 8 to about 18, preferably from about 8 to about 15, carbon atoms. Examples of anionic surfactants include, but are not limited to, linear alkyl sulfates, alkyl sulfonates, and the like. Examples of nonionic surfactants include alkylethoxylates and the like. Examples of zwitterionic surfactants include betaines and sulfobetaines. Examples of amphoteric surfactants include alkylampho glycines, and alkyl imino propionate. Further example of suitable surfactants are described in McCutcheon's Vol. 1: Emulsifiers and Detergents, North American Ed., McCutcheon Division, MC Publishing Co., 1995, which is incorporated herein by reference

Highly preferred surfactants include alcohol ethoxylate detergent surfactant (e.g., Neodol 1-5®, available from Shell Chemical Co.) and an alkyl sulfonate (e.g., Witconate NAS-8, a linear C₈ sulfonate available from Witco Co.) and mixtures thereof.

Soil Suspending Agents

The hard surface cleaning compositions of the present invention can optionally (preferably) include a soil suspending agent. The soil suspending agents, preferably water

soluble polymers, for use in the detergent composition and/or cleaning solution of this invention are preferably selected from a group consisting of, ethoxylated and/or propoxylated polyalkylamines, carboxylate polymers, nitrogen-based zwitterionic polymers, polyethyleneoxides, polyphosphates, and cellulosic polymers.

5 Preferred soil suspending agents are ethoxylated polyalkylamines. Such agents are disclosed in U. S. Pat. Patent Number: 4,891,160, issued January 2, 1990, entitled Detergent compositions containing ethoxylated amines having, clay soil removal/anti-redeposition properties, by Vander Meer, James M.

Preferred ethoxylated polyamines can be derived from polyamino amides and/or
10 polyaminopropyleneoxide materials. Preferred ethoxylated amine polymers are the ethoxylated C₂-C₃ polyalkyleneamines and polyalkyleneimines. Particularly preferred ethoxylated polyalkyleneamines and polyalkyleneimines are the ethoxylated polyethyleneamines (PEAs) and polyethyleneimines (PEIs). Each hydrogen atom attached to each nitrogen atom represents an active site for subsequent ethoxylation. Preferred
15 have a molecular weight of from about 140 to about 310, preferably from about 140 to about 200. These PEAs can be obtained by reactions involving ammonia and ethylene dichloride, followed by fractional distillation. The common PEAs obtained are triethylenetetramine (TETA) and tetraethylenepentamine (TEPA). Above the pentamines, i.e., the hexamines, heptamines, octamines and possibly nonamines, the
20 cogenerically derived mixture does not appear to separate by distillation and can include other materials such as cyclic amines and particularly piperazines. There can also be present cyclic amines with side chains in which nitrogen atoms appear. See U.S. Pat. No. 2,792,372 to Dickson, issued May 14, 1957, which describes the preparation of PEAs. The minimum degree of ethoxylation required for preferred soil suspension performance
25 can vary depending upon the number of units in the PEA.

The PEIs used in preparing the compounds of the present invention have a molecular weight of at least about 600 prior to ethoxylation, which represents at least about 10 units. Preferred PEIs used in preparing these compounds have an average molecular weight of from about 600 to about 2600. Although linear polymer backbones
30 are possible, branched chains can also occur. The relative proportions of primary, secondary and tertiary amine groups present in the polymer can vary, depending on the

manner of preparation. Each hydrogen atom attached to each nitrogen atom of the PEI represents an active site for subsequent ethoxylation. These PEIs can be prepared, for example, by polymerizing ethyleneimine in the presence of a catalyst such as carbon dioxide, sodium bisulfite, sulfuric acid, hydrogen peroxide, hydrochloric acid, acetic acid, etc. Specific methods for preparing PEIs are disclosed in U.S. Pat. No. 2,182,306 to Ulrich et al., issued Dec. 5, 1939; U.S. Pat. No. 3,033,746 to Mayle et al., issued May 8, 1962; U.S. Pat. No. 2,208,095 to Esselmann et al., issued July 16, 1940; U.S. Pat. No. 2,806,839 to Crowther, issued Sept. 17, 1957; and U.S. Pat. No. 2,553,696 to Wilson, issued May 21, 1951 (all incorporated herein by reference).

The minimum degree of ethoxylation required for suitable soil suspension performance can increase as the molecular weight of the PEI increases, especially much beyond about 1800. Also, the degree of ethoxylation for preferred compounds increases as the molecular weight of the PEI increases. For preferred PEAs and PEIs having a molecular weight of at least about 600, the degree of ethoxylation is preferably at least about 1, with a more preferred range of from about 12 to about 42. For PEAs and PEIs having a molecular weight of at least 1600, the degree of ethoxylation is preferably at least about 2, with a typical range of from about 10 to about 40. The level at which the ethoxylated amine(s) can be present in the detergent compositions herein can vary depending upon the compounds used.

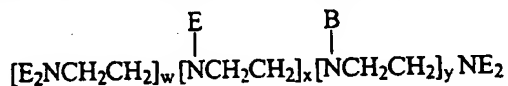
Generally, the ethoxylated amines can be included in an amount of from about 0.001% to about 1% by weight of the composition, with the preferred range being from about 0.005% to about 0.5% by weight, and a more preferred range of about 0.01% to 0.1%.

Still other suitable compounds are disclosed in U. S. Pat. Patent Number: 5,565,145, issued October 15, 1996, entitled Compositions comprising ethoxylated/propoxylated, polyalkyleneamine polymers as soil dispersing agents, by Watson, Randall A.; Gosselink, Eugene P.; and Zhang, Shulin, incorporated herein by reference.

These compounds are ethoxylated/propoxylated polyalkyleneamine polymers. The polyalkyleneamines comprise a nitrogen-containing backbone with an average

molecular weight of from about 600 to about 10,000, preferably from about 1,000 to about 3,000.

An example of suitable polyalkylamine has the general formula:

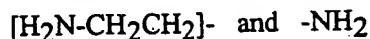


5 wherein B is a continuation by branching of the polyethyleneimine backbone and E is an ethyleneoxy unit having the formula:

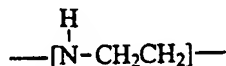


wherein m has an average value of about 20. What is meant herein by an average value of 20 is that sufficient ethylene oxide or other suitable reagent is reacted with the polyethyleneimine starting material to fully ethoxylate each N-H unit in the polyethyleneamine to an average degree of 20 ethoxy groups.

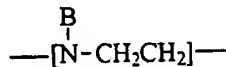
The units which make up the polyalkyleneimine backbones are derived from primary amine units having the formula:



15 which terminate the main backbone and any branching chains, secondary amine units having the formula:



and which, after modification, have their hydrogen atom substituted by an average of 20 ethyleneoxy units, and tertiary amine units having the formula:



20 which are the branching points of the main and secondary backbone chains, B representing a continuation of the chain structure by branching. The tertiary units have no replaceable hydrogen atom and are therefore not modified by substitution with ethyleneoxy units. During the formation of the polyamine backbones cyclization may occur, therefore, an amount of cyclic polyamine can be present in the parent polyalkyleneimine backbone mixture. Each primary and secondary amine unit of the cyclic alkyleneimines undergoes modification by the addition of alkyleneoxy units in the same manner as linear and branched polyalkyleneimines.

The indices w, x, and y have values such that the average molecular weight of the polyethyleneimine backbone prior to modification is about 600 daltons. In addition, those skilled in the art will recognize that each branch chain must terminate in a primary amine unit, therefore the value of the index w is y + 1 in the case where no cyclic amine
5 backbones are present. The average molecular weight for each ethylene backbone unit, -NCH₂CH₂-, is approximately 43 daltons.

Other soil suspending materials include polyvinyl pyrrolidone and/or cellulose derivatives. Polyvinyl pyrrolidone is not a single individual compound but can be obtained in almost any degree of polymerization. The degree of polymerization, which is
10 most easily expressed in terms of average molecular weight, is not critical provided the material has the desired water solubility and soil-suspending power. In general, suitable soil-suspending vinyl pyrrolidone polymers are linear in structure, and have an average molecular weight within the range of about 5,000 to about 100,000, and preferably from about 15,000 to about 50,000. Suitable polymers will also, generally, have a water
15 solubility of greater than 0.3% at normal usage temperatures.

Any well-known nonionic cellulose ether can be used in the detergent composition according to the invention. Preferably the cellulose ether is an alkyl or an alkyl/hydroxyalkyl cellulose derivative. The alkyl group should contain from 1 to 4, preferably from 1 to 3 carbon atoms, and the hydroxyalkyl group should contain from 2 to 4,
20 preferably from 2 to 3 carbon atoms. Particularly preferred materials include methyl hydroxyethyl cellulose, methyl hydroxypropyl cellulose and ethyl hydroxyethyl cellulose. The total level of the polyvinyl pyrrolidone and/or cellulose derivatives in the detergent composition is preferably in the range of about 0.001% to about 1% by weight of the composition, a more preferred range being from about 0.005% to about 0.5% by weight,
25 and a more preferred range of about 0.01% to 0.1%.

An improvement in soil suspension can be achieved at all mixing ratios of the vinyl pyrrolidone polymer and the nonionic cellulose ether. Preferably, the ratio of the vinyl pyrrolidone polymer to the nonionic cellulose ether in the detergent composition is within the range from about 8:2 to about 2:8, most preferably from about 6:4 to about 4:6,
30 by weight. Mixtures of this type are disclosed in U. S. Pat. Patent Number: 4,999,129, entitled Process and composition for washing soiled polyester, fabrics, by Michael Hull.

Other soil suspending agents can be anionic polymers. Examples of these anionic polymers are disclosed in, e.g., U. S. Pat. Number: 5789369, entitled, Modified polyacrylic acid polymers for anti-redeposition performance, by Gopalkrishnan, Sridhar; Guiney, Kathleen M.; and Sherman, John V. The total molecular weight of the copolymer disclosed in said patent are within the range of about 1000 to 100,000, as determined by gel permeation chromatography. More preferably, the weight average molecular weight falls within the range of about 1,000 to 30,000; most preferably within the range of about 1,000 to 20,000.

The hydrophilic copolymer can be prepared by copolymerizing two monomers, an unsaturated hydrophilic monomer and a hydrophilic oxyalkylated monomer. Examples of unsaturated hydrophilic monomers disclosed include acrylic acid, maleic acid, maleic anhydride, methacrylic acid, methacrylate esters and substituted methacrylate esters, vinyl acetate, vinyl alcohol, methylvinyl ether, crotonic acid, itaconic acid, vinyl acetic acid, and vinylsulphonate. The unsaturated hydrophilic monomer component of the hydrophilic copolymer is preferably acrylic acid. Examples of the hydrophilic oxyalkylated monomer include compounds that have a polymerizable olefinic moiety with at least one acidic hydrogen and are capable of undergoing addition reaction with alkylene oxide. It is also possible to include monomers with at least one acidic hydrogen that are polymerized first, and then subsequently oxyalkylated to yield the desired product. For example, allyl alcohol is especially preferred since it represents a monofunctional initiator with a polymerizable olefinic moiety having an acidic hydrogen on the oxygen, and is capable of adding to alkylene oxide. Other examples of the hydrophilic oxyalkylated monomer of the copolymer include reaction products of either acrylic acid, methacrylic acid, maleic acid, or 3-allyloxy-1,2-propanediol with alkylene oxide. Preparation of oxyalkylated monomers is disclosed in U.S. Pat. No. 5,162,475 and U.S. Pat. No. 4,622,378 both incorporated herein by reference. Especially preferred is the hydrophilic oxyalkylated monomer which is a propylene oxide and ethylene oxide adduct of allyl alcohol. This monomer has a molecular weight of about 3800. The molecular weight of the hydrophilic oxyalkylated monomer according to the various embodiments of the invention should be preferably within the range of about 600 to 30,000, more preferably about 700 to 15,000, and most preferably about 700 to 5000. The hydrophilic oxyalkylated

monomer preferably has a solubility of about 500 grams/liter, more preferably about 700 grams/liter in water.

Other polymeric polycarboxylates that are suitable include, for example, the polymers disclosed in U. S. Pat. 5,574,004, incorporated herein by reference. Such polymers include homopolymers and/or copolymers (composed of two or more monomers) of an alpha, beta-ethylenically unsaturated acid monomer such as acrylic acid, methacrylic acid, a diacid such as maleic acid, itaconic acid, fumaric acid, mesoconic acid, citraconic acid and the like, a monoester of a diacid with an alkanol, e.g., having 1-8 carbon atoms, and mixtures thereof. When the polymeric polycarboxylate is a copolymer, it can be a copolymer of more than one of the foregoing unsaturated acid monomers, e.g., acrylic acid and maleic acid, or a copolymer of at least one of such unsaturated acid monomers with at least one non-carboxylic alpha, beta-ethylenically unsaturated monomer which can be either relatively non-polar such as styrene or an olefinic monomer, such as ethylene, propylene or butene-1, or which has a polar functional group such as vinyl acetate, vinyl chloride, vinyl alcohol, alkyl acrylates, vinyl pyridine, vinyl pyrrolidone, or an amide of one of the delineated unsaturated acid monomers, such as acrylamide or methacrylamide. Certain of the foregoing copolymers can be prepared by after treating a homopolymer or a different copolymer, e.g., copolymers of acrylic acid and acrylamide by partially hydrolyzing a polyacrylamide. Copolymers of at least one unsaturated carboxylic acid monomer with at least one non-carboxylic co-monomer should contain at least about 50 mol % of polymerized carboxylic acid monomer. The polymeric polycarboxylate should have a number average molecular weight of, for example about 1000 to 10,000, preferably about 2000 to 5000. To ensure substantial water solubility, the polymeric polycarboxylate is completely or partially neutralized, e.g., with alkali metal ions, preferably sodium ions.

The total level of the polymeric polycarboxylate in the detergent composition is preferably in the range of about 0.001% to about 1% by weight of the composition, a more preferred range being from about 0.005% to about 0.5% by weight, and a more preferred range of about 0.01% to 0.1%.

Still other polycarboxylate materials include those disclosed in U. S. Pat. Patent Number: 5,470,510, issued November 28, 1995, entitled Dispersing agent, by Willey,

Alan D. The polymers can be derived from L-glumatic acid, D-glumatic acid or mixtures, e.g. racemates, of these L and D isomers. The L isomer and D, L racemate are currently preferred. The polymers include not only the homopolymers of glutamic acid but also copolymers, such as block, graft or random copolymers, containing glutamic acid. Thus, 5 copolymers of glutamic acid with at least one other (preferably biodegradable) monomer, oligomer or polymer come into consideration. These include, for example, copolymers containing at least one other amino acid, such as aspartic acid, ethylene glycol, ethylene oxide, (or an oligomer or polymer of any of these) or polyvinyl alcohol. Glutamic acid can, of course, carry one or more substituents and the polymers useful as component (a) 10 include those in which a proportion or all of the glutamic acid monomers are substituted. Substituents include, for example, alkyl, hydroxy alkyl, aryl and arylalkyl, commonly with up to 18 carbon atoms per group, or polyethylene glycol attached by ester linkages.

Other soil suspending agents suitable herein include cellulose derivatives such as methylcellulose, carboxymethylcellulose and hydroxyethylcellulose. The total level of 15 cellulose derivatives in the detergent composition is preferably in the range of about 0.001% to about 1% by weight of the composition, a more preferred range being from about 0.005% to about 0.5% by weight, and a more preferred range of about 0.01% to 0.1%.

Further useful organic polymeric compounds are the polyethylene glycols, 20 particularly those of average molecular weight of 1,000-100,000, more particularly 2000 to 10,000 and most preferably 4,000. These can be used alone or in combination with the polycarboxylate polymers disclosed herewithin. The total level of these polymers in the detergent composition is preferably in the range of about 0.001% to about 1% by weight of the composition, a more preferred range being from about 0.005% to about 0.5% by 25 weight, and a more preferred range of about 0.01% to 0.1%.

Further examples of suitable soil suspending agent can be found in co-pending U.S. Patent Application Serial No. 60/110,356, filed December 1, 1998 K. W. Willman, et al. (P&G Case 7367P) which is incorporated by reference herein.

Hydrophilic Polymer

30 For the purpose of helping to level the solution during drying the composition preferably contains a polymer that has hydrophilic and shear-thinning characteristics that

is capable of inhibiting molecular aggregation of surfactant solution on floors during the dry-down process to provide one, or more, of the benefits of: strippability; avoidance of build-up; easy spreading of solution on hard surfaces such as floors; and maintaining a sufficient amount of water on the surface to level the ingredients remaining on the surface. By leveling we mean minimizing solution de-wetting from the surface during drying which, in turn, minimizes streaking. Because of this benefit, the polymer allows formulation at even low surfactant levels and allows for addition of solvents to aid in cleaning without hurting filming/streaking.

When present in the composition the hydrophilic, shear-thinning polymer that is capable of inhibiting molecular aggregation of surfactant solution on floors during the dry-down process, is present in an amount of from about 0.0001% to about 0.2%, more preferably from about 0.0001% to about 0.1%, even more preferably from about 0.0005% to about 0.08%, by weight of the composition. It is preferred that hydrophilic, shear-thinning polymer has a molecular weight of at least about 100,000, preferably at least about 1,000,000.

Preferably the hydrophilic, shear-thinning polymer is selected from the group of polymers consisting of xanthan gum, guar gum, gum arabic, pectin and mixtures thereof, preferably xanthan gum.

Further examples of suitable hydrophilic, shear-thinning polymer can be found in co-pending U.S. Patent Application Serial No. 60/061,296, filed October 7, 1997 by N. J. Policicchio, et al. (P&G Case 6873P), which is incorporated by reference herein.

Suds Suppressor

The composition of the present invention can optionally contain a suds suppressor. When present the suds suppressor is preferably present from about 0.0005% to about 0.02%, more preferably from about 0.001% to about 0.01%, by weight of the composition.

Suitable suds suppressors include, silicone suds suppressor such as silicone polymers and linear or branched C₁₀-C₁₈ fatty acids or alcohols, with silicone suds suppressor being preferred.

Further examples of suitable suds suppressors can be found in co-pending U.S. Patent Applications Serial Nos. 60/041,273, filed March 20, 1997 by R. A. Masters, et al.

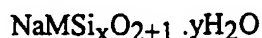
(P&G Case 6555P), and 60/045,858, filed May 8, 1997 by R. A. Masters, et al. (P&G Case 6555P2), both of which are incorporated by reference herein.

Corrosion Inhibitor

The composition of the present invention can optionally contain a corrosion
5 inhibitor. When present the corrosion inhibitor is preferably present from about 0.0001% to about 0.2%, preferably from about 0.0001% to about 0.1%, more preferably from about 0.0005% to about 0.08% by weight of the composition.

One suitable group of corrosion inhibitors include the crystalline layered silicates as disclosed, for example, in EP-A-0164514, DE-A-3417649 and DE-A-3742043.

10 Preferred are the crystalline layered sodium silicates of general formula



wherein M is sodium or hydrogen, x is a number from 1.9 to 4 and y is a number from 0 to 20. Crystalline layered sodium silicates of this type preferably have a two dimensional 'sheet' structure, such as the so called δ -layered structure, as described in EP 0 164514 and
15 EP 0 293640.

The most preferred crystalline layered sodium silicate compound has the formula δ - $\text{Na}_2\text{Si}_2\text{O}_5$, known as NaSKS-6 (trade name), available from Hoechst AG.

A preferred alkali metal silicate is sodium silicate having an $\text{SiO}_2:\text{Na}_2\text{O}$ ratio of from 1.8 to 3.0, preferably from 1.8 to 2.4, most preferably 2.0. Sodium silicate is
20 preferably present at a level of less than 20%, preferably from 1% to 15%, most preferably from 3% to 12% by weight of SiO_2 . The alkali metal silicate may be in the form of either the anhydrous salt or a hydrated salt.

Another suitable corrosion inhibitor are the alkali or alkaline earth metal metasilicate, more preferably alkali metal metasilicate, even more preferably sodium
25 metasilicate, present at a level of at least 0.4% SiO_2 by weight. Sodium metasilicate has a nominal $\text{SiO}_2 : \text{Na}_2\text{O}$ ratio of 1.0. The weight ratio of said sodium silicate to said sodium metasilicate, measured as SiO_2 , is preferably from 50:1 to 5:4, more preferably from 15:1 to 2:1, most preferably from 10:1 to 5:2.

Other suitable corrosion inhibitors include paraffin, and nitrogen-containing
30 corrosion inhibitor compounds. Nitrogen-containing corrosion inhibitor compounds are disclosed in copending European Application no. EP-A-634,478. Mn(II) compounds for

use in corrosion inhibition are described in copending European Application No. EP-A-672 749.

While not wishing to be limited by theory, it is believed that the functional role of the corrosion inhibitor is to form 'in use' a protective coating layer on any metal components of an implement in which the compositions of the invention are being stored and applied to a hard surface through. Furthermore, the corrosion inhibitor have the additional benefit of providing corrosion inhibition to the surfaces to which it is applied. Such surfaces would include ranges, refrigerators, and any other surface which is wetted in delivering the solution to the hard surface, such as the floor.

Suitable corrosion inhibitor herein include fatty esters of mono- or polyhydric alcohols having from 1 to 40 carbon atoms in the hydrocarbon chain. The fatty acid portion of the fatty ester can be obtained from mono- or poly-carboxylic acids having from 1 to 40 carbon atoms in the hydrocarbon chain. Suitable examples of monocarboxylic fatty acids include behenic acid, stearic acid, oleic acid, palmitic acid, myristic acid, lauric acid, acetic acid, propionic acid, butyric acid, isobutyric acid, Valeric acid, lactic acid, glycolic acid and β,β' - dihydroxyisobutyric acid. Examples of suitable polycarboxylic acids include: n-butyl-malonic acid, isocitric acid, citric acid, maleic acid, malic acid and succinic acid.

The fatty alcohol radical in the fatty ester can be represented by mono- or polyhydric alcohols having from 1 to 40 carbon atoms in the hydrocarbon chain. Examples of suitable fatty alcohols include; behenyl, arachidyl, cocoyl, oleyl and lauryl alcohol, ethylene glycol, glycerol, ethanol, isopropanol, vinyl alcohol, diglycerol, xylitol, sucrose, erythritol, pentaerythritol, sorbitol or sorbitan. Preferably, the fatty acid and/or fatty alcohol group of the fatty ester adjunct material have from 1 to 24 carbon atoms in the alkyl chain.

Preferred fatty esters herein are ethylene glycol, glycerol and sorbitan esters wherein the fatty acid portion of the ester normally comprises a species selected from behenic acid, stearic acid, oleic acid, palmitic acid or myristic acid.

The glycerol esters are also highly preferred. These are the mono-, di- or tri-esters of glycerol and the fatty acids as defined above. Specific examples of fatty alcohol esters for use herein include: stearyl acetate, palmityl di-lactate, cocoyl isobutyrate, oleyl

maleate, oleyl dimaleate, and tallowyl propionate. Fatty acid esters useful herein include: xylitol monopalmitate, pentaerythritol monostearate, sucrose monostearate, glycerol monostearate, ethylene glycol monostearate, sorbitan esters. Suitable sorbitan esters include sorbitan monostearate, sorbitan palmitate, sorbitan monolaurate, sorbitan monomyristate, sorbitan monobehenate, sorbitan mono-oleate, sorbitan dilaurate, sorbitan distearate, sorbitan dibehenate, sorbitan dioleate, and also mixed tallowalkyl sorbitan mono- and di-esters. Glycerol monostearate, glycerol mono-oleate, glycerol monopalmitate, glycerol monobehenate, and glycerol distearate are preferred glycerol esters herein.

10 Suitable corrosion inhibitor include triglycerides, mono or diglycerides, and wholly or partially hydrogenated derivatives thereof, and any mixtures thereof. Suitable sources of fatty acid esters include vegetable and fish oils and animal fats. Suitable vegetable oils include soy bean oil, cotton seed oil, castor oil, olive oil, peanut oil, safflower oil, sunflower oil, rapeseed oil, grapeseed oil, palm oil and corn oil.

15 Waxes, including microcrystalline waxes are suitable corrosion inhibitor herein. Preferred waxes have a melting point in the range from 35°C to 110°C and comprise generally from 12 to 70 carbon atoms. Preferred are petroleum waxes of the paraffin and microcrystalline type which are composed of long-chain saturated hydrocarbon compounds.

20 One preferred corrosion inhibitor is a paraffin oil, typically a predominantly branched aliphatic hydrocarbon having a number of carbon atoms in the range of from 20 to 50; preferred paraffin oil selected from predominantly branched C₂₅₋₄₅ species with a ratio of cyclic to noncyclic hydrocarbons of from 1:10 to 2:1, preferably from 1:5 to 1:1. A paraffin oil meeting these characteristics, having a ratio of cyclic to noncyclic hydrocarbons of 32:68, is sold by Wintershall, Salzbergen, Germany, under the trade name WINOG 70.

25 However, it is preferred to not use a paraffin oil, hydrocarbons or the like as a corrosion inhibitor as this would increase the hazing of the hard surface to which it is applied. When an oil or similar material is to be used in the compositions of the present invention they are selected so as to minimize, and if possible eliminate, any haze produced on the hard surface which is attributable to the paraffin oil or the like.

Suitable nitrogen-containing corrosion inhibitor compounds include imidazole and derivatives thereof such as benzimidazole, 2-heptadecyl imidazole and those imidazole derivatives described in Czech Patent No. 139, 279 and British Patent GB-A-1,137,741, which also discloses a method for making imidazole compounds.

5 Also suitable as nitrogen-containing corrosion inhibitor compounds are pyrazole compounds and their derivatives, particularly those where the pyrazole is substituted in any of the 1, 3, 4 or 5 positions by substituents R_1 , R_3 , R_4 and R_5 where R_1 is any of H, CH_2OH , $CONH_2$, or $COCH_3$, R_3 and R_5 are any of C_1 - C_{20} alkyl or hydroxyl, and R_4 is any of H, NH_2 or NO_2 .

10 Other suitable nitrogen-containing corrosion inhibitor compounds include benzotriazole, 2-mercaptobenzothiazole, 1-phenyl-5-mercapto-1,2,3,4-tetrazole, thionalide, morpholine, melamine, distearylamine, stearyl stearamide, cyanuric acid, aminotriazole, aminotetrazole and indazole.

Other suitable additional corrosion inhibitor compounds include, mercaptans and
15 diols, especially mercaptans with 4 to 20 carbon atoms including lauryl mercaptan, thiophenol, thionaphthol, thionalide and thioanthranol. Also suitable are saturated or unsaturated C_{10} - C_{20} fatty acids, or their salts, especially aluminium tristearate, zinc distearate. The C_{12} - C_{20} hydroxy fatty acids, or their salts, are also suitable. Phosphonated octa-decane and other anti-oxidants such as beta-hydroxytoluene (BHT) are
20 also suitable.

Copolymers of butadiene and maleic acid, particularly those supplied under the trade reference no. 07787 by Polysciences Inc have been found to be of particular utility as corrosion inhibitor compounds.

Another preferred anticorrosion inhibitor for use in the present invention is a
25 hydrocarbon oil, typically a predominantly long chain, aliphatic hydrocarbons having a number of carbon atoms in the range of from 20 to 50; preferred hydrocarbons are saturated and/or branched; preferred hydrocarbon oil selected from predominantly branched C_{25-45} species with a ratio of cyclic to noncyclic hydrocarbons of from 1:10 to 2:1, preferably from 1:5 to 1:1. A preferred hydrocarbon oil is paraffin. A paraffin oil
30 meeting the characteristics as outlined above, having a ratio of cyclic to noncyclic

hydrocarbons of 32:68, is sold by Wintershall, Salzbergen, Germany, under the trade name WINOG 70.

Another suitable corrosion inhibitor are water-soluble bismuth compound. The water-soluble bismuth compound may be essentially any salt or complex of bismuth with essentially any inorganic or organic counter anion. Preferred inorganic bismuth salts are selected from the bismuth trihalides, bismuth nitrate and bismuth phosphate. Bismuth acetate and citrate are preferred salts with an organic counter anion.

Suitable corrosion inhibitors can also be found in U.S. Patent No. 4,199,483; U.S. Patent No. 4,992,195; U.S. Patent No. 4,098,720; U.S. Patent No. 5,736,495; U.S. Patent No. 3,981,780; U.S. Patent No. 4,292,190; all of which are hereby incorporated by reference.

Corrosion inhibitors particularly useful under alkaline compositions include sorbitan monooleate; morpholines; 3-fluoroaniline; sodium benzoate; benzoic acid; p-tert-butylbenzoic acid; sodium nitrate; sodium nitrite; salicylic acid; thiosalicylic acid; resorcinol; sodium phosphates; polyphosphates; sodium silicates; sodium borates; borax; sodium chromate; benzenesulfonic acid; benzotriazole; tolytriazole; octadecylamine; hexadecylamine; sodium molybdate; and sodium tungstate.

It is preferred that the corrosion inhibitor, when present in the composition is selected from the group consisting of alkali metal or alkaline earth salts of silicate, alkali metal or alkaline earth salts of metasilicate, polyvalent ion salts of fatty acids, alkyl phosphates, paraffin, benzotriazole, inorganic salts of Bi^{2+} , organosilicates, inorganic salts of Zn^{2+} , and mixtures thereof. It is also preferable to minimize the amount of chloride ions present in the composition as higher levels of chloride ions are believed to increase corrosion.

Other optional composition ingredients

The detergent composition (cleaning solution), herein, may further comprise other optional ingredients. Suitable ingredients include, but not limited to: hydrophobic cleaning solvents, detergent builders, dyes, detergent enzymes, and/or perfumes etc.

Suitable hydrophobic cleaning solvents include short chain (e.g., $\text{C}_1\text{-C}_6$) derivatives of oxyethylene glycol and oxypropylene glycol, such as mono- and di-ethylene glycol n-hexyl ether, mono-, di- and tri-propylene glycol n-butyl ether, and the like. The

level of hydrophobic cleaning solvent, e.g., solvent having a solubility in water of less than about 3%, is in the cleaning composition at less than about 3%, more preferably less than about 2% by weight of the composition.

Suitable detergent builders include those derived from phosphorous sources, such as orthophosphates, pyrophosphates, tripolyphosphates, etc., and those derived from non-phosphorous sources, such as nitrilotriacetates; and the like. Suitable detergent enzymes include lipases, proteases, amylases and other enzymes known to be useful for catalysis of soil degradation.

The total level of such optional ingredients is low, preferably less than about 0.1%, more preferably less than about 0.05%, to avoid causing hazing or filming/streaking problems. Furthermore, any water in the composition, such as in premixed or ready to use solutions, the water used is deionized or softened water.

Cleaning Kits

In another aspect of the present invention a kit is provided for. This kit comprises an implement containing a pad containing superabsorbent material and a detergent composition that provides effective cleaning and good hazing streaking when used with a disposable cleaning pad and without rinsing comprising an effective amount of an anti-hazing agent. It is preferred that the implement comprises:

- a. a handle; and
- b. a removable cleaning pad preferably containing an effective amount of a superabsorbent material, and having a plurality of substantially planar surfaces, wherein each of the substantially planar surfaces contacts the surface being cleaned, more preferably said pad is a removable cleaning pad having a length and a width, the pad comprising
 - i. a scrubbing layer; and
 - ii. an absorbent layer comprising a first layer and a second layer, where the first layer is located between the scrubbing layer and the second layer (i.e., the first layer is below the second layer) and has a smaller width than the second layer.

An important aspect of the cleaning performance provided by the preferred pad is related to the ability to provide multiple planar surfaces that contact the soiled surface

during the cleaning operation. In the context of a cleaning implement such as a mop, these planar surfaces are provided such that during the typical cleaning operation (i.e., where the implement is moved back and forth in a direction substantially perpendicular to the pad's width), each of the planar surfaces contact the surface being cleaned as a result of "rocking" of the cleaning pad.

One of ordinary skill in the art can select various materials that can be utilized to prepare the disposable pads and/or implements herein. Thus, while preferred materials are described herein for the various implement and cleaning pad components, it is recognized that the scope of operable materials is not limited to such disclosures.

More details on suitable cleaning pads (such as those which include superabsorbent material), implements, and the components of the implements, such as the removable cleaning pad, handle etc., can be found in co-pending U.S. Patent Applications Serial Nos. 08/756,774, filed November 26, 1996 by V. S. Ping, et al. (P&G Case 6383), and 08/716,755, filed September 23, 1996 by A. J. Irwin (P&G Case 6262), 60/061,296, filed October 7, 1997 by N. J. Policicchio, et al. (P&G Case 6873P), 09/037,379, filed March 10, 1998 by R. A. Masters, et al. (P&G Case 6553), 60/041,273, filed March 20, 1997 by R. A. Masters, et al. (P&G Case 6555P), 60/045,858, filed May 8, 1997 by R. A. Masters, et al. (P&G Case 6555P2), 60/085,837, filed May 18, 1998 (P&G Case 7159P), 08/756,999, filed November 26, 1996 (P&G Case 6269R), 08/756,864, filed November 26, 1996 (P&G Case 6270R), 08/756,616, filed November 26, 1996 (P&G Case 6382), 08/756,774, filed November 26, 1996 (P&G Case 6383), 08/756,151, filed November 26, 1996 (P&G Case 6384), 08/756,997, filed November 26, 1996 (P&G Case 6385), 08/756,998, filed November 26, 1996 (P&G Case 6386), 08/756,507, filed November 26, 1996 (P&G Case 6387), 09/201,618, filed November 30, 1998 (P&G Case 7361), 60/110,356, filed December 1, 1998 K. W. Willman, et al. (P&G Case 7367P), 60/110,476, filed December 1, 1998 N. J. Policicchio, et al. (P&G Case 7368P), 09/201,620 filed November 30, 1998 (P&G Case 7362), and 09/290,960, filed April 13, 1999 entitled "Bottles having Removal Resist Closures" (P&G Case 7497), all of which are incorporated herein by reference. See also WO Applications Nos. 98/11813, and 98/42819, both of which are incorporated herein by reference.

EXAMPLES

Example 1

(Preferred ranges)

Surfactant	0.03 to 0.5
Anti-Hazing agent	0.01 to 2.0
Soil suspending agent	0.001 to 1.0
Dye system	0.0 to 3.0
Shear Thinning polymer	0.0001 to 0.2
Suds Suppressor	0.0005 to 0.02
Anti-corrosion agent	0.0 to 0.1
Perfume	0.0 to 2.0
Water and minors	91.2 to 99.6

Example 2

	B	C	D	E	F	G	H	I
Surfactant ¹	0.03	0.3	0.14	0.03	0.1	0.3	0.5	0.14
Anti-Hazing agent ²	0.1	0.5	0.35	0.3	0.1	0.06	0.5	0.35
Soil suspending agent ³	0.06	0.1	0.04	0.3	0.02	0.08	0.02	-
Dye system ⁴	0.5	0.75	0.5	1.0	0.5	1.0	-	-
Shear Thinning polymer ⁵	0.01	-	0.005	0.05	0.01	-	-	-
Shear Thinning polymer ⁹	-	0.001	-	-	-	0.001	0.05	-
Suds Suppressor ⁶	0.001	0.009	0.0013	0.015	0.0005	0.01	0.0005	-
Anti-corrosion agent ⁷	0.001	0.01	0.001	0.003	-	0.001	-	-
Anti-corrosion agent ⁸	-	-	-	-	0.05	-	-	-
Perfume	0.06	0.06	0.06	0.02	0.015	0.06	-	-
Water and minors	Bal	Bal	Bal	Bal	Bal	Bal	Bal	Bal

- 1: 1:1 Mixture of Neodol 1-5 (Shell Chemical) and Witconate NAS-89(Witco);
- 2: 1,3-bis(methylamine)-cyclohexane, (Mitsubishi Gas Products);
- 3: Ethoxylated polyamine, 1600 MW polyamine backbone before addition of 20 moles of ethylene oxide per available nitrogen;
- 5 4: 0.0005 to 0.005% thymolphthalein, with the balance volatile dye solvent, typically ethanol;
- 5: Xanthan gum;
- 6: Silicone based suds suppressor (Dow Corning);
- 7: Sodium metasilicate or
- 10 8: NaNO_3 .
- 9: Pectin.

WHAT IS CLAIMED IS:

1. Hard surface detergent composition comprising an effective amount of anti-hazing agent, said anti-hazing agent being selected from the group consisting of organic diamine, having molecular weight of from greater than 61 g/mol to less than or equal to 400 g/mol, organic triamines having molecular weight less than or equal to 500 g/mol, organic tetramines having molecular weight less than or equal to 600 g/mol, and mixtures thereof, and wherein said anti-hazing agent has a pKa of at least 8; and an effective amount of one or more detergent surfactants; wherein the weight ratio of said anti-hazing agent to said surfactants is from 40:1 to 1:5, preferably from 10:1 to 1:5, more preferably from 5:1 to 1:5; and said composition has a pH greater than 8, preferably greater than 9, more preferably from 9.5 to 12.5, more preferably from 9.5 to 11.7.
2. The detergent composition of Claim 1 wherein the level of said anti-hazing agent is from 0.001% to 5%, by weight of the composition.
3. The detergent composition according to either Claim 1 or 2 wherein said anti-hazing agent is selected from the group consisting of 1,3-bis(amino methyl)-cyclohexane(also known as 1, 3 cyclohexanebis(methylamine) or 1, 3 BAC), N-cyclohexyl-1,3-propanediamine, 1,2-diaminocyclohexane, 1, 3 cyclohexane Bis[tetra(hydroxypropyl)-methylamine], 1,3 benzene dimethanamine, N-phenylethylene diamine, 1,3 bis[tris(hydroxymethyl)-methylamino]propane, N,N,N',N'tetrakis(2-hydroxypropyl)ethylenediamine, N,N'-bis(bishydroxypropyl)ethylene diamine, N,N'-bis(bishydroxyethyl)ethylene diamine, N,N',N'tetrakis(2-hydroxyethyl)-ethylenediamine, 1,3, Bis[tris(hydroxymethyl)methylamino]propane, 1,3 benzene dimethanamine, and mixtures thereof.
4. The detergent composition according to any one of Claims 1 to 3 wherein said anti-hazing agent is 1,3-bis(amino methyl)-cyclohexane.

5. The detergent composition according to any one of Claims 1 to 4 further comprising from 0.001% to 0.1% by weight of the composition of a soil suspending agent.
6. The detergent composition according to any one of Claims 1 to 5 further comprising
5 an effective amount of suds suppressor.
7. The detergent composition according to any one of Claims 1 to 6 further comprising from 0.0001% to 0.2%, preferably from 0.0001% to 0.1%, more preferably from 0.0005% to 0.08% by weight of the composition, of hydrophilic, shear-thinning
10 polymer that is capable of inhibiting molecular aggregation of surfactant solution on floors during the dry-down process.
8. The detergent composition according to Claim 7 wherein the hydrophilic, shear-thinning polymer has a molecular weight of at least 100,000, preferably at least
15 1,000,000.
9. The detergent composition according to any one of Claims 1 to 8 further comprising from 0.0001% to 0.2%, preferably from 0.0001% to 0.1%, more preferably from 0.0005% to 0.08% by weight of the composition of a corrosion inhibitor.
20
10. The detergent composition according to any one of Claims 1 to 9 in a container, in association with instructions to use it with a pad containing a superabsorbent material.
11. The process of cleaning a surface comprising applying an effective amount of the
25 detergent composition according to any one of Claims 1 to 9 and absorbing the composition in an absorbent structure comprising a superabsorbent material.
12. A kit comprising an implement containing a pad containing superabsorbent material and a detergent composition that provides effective cleaning and good filming
30 streaking when used with a disposable cleaning pad and without rinsing comprising an

effective amount of an anti-hazing agent, said anti-hazing agent selected from the group consisting of organic diamine, having molecular weight of from greater than 61 g/mol to less than or equal to 400 g/mol, organic triamines having molecular weight less than or equal to 400 g/mol, organic tetramines having molecular weight less than or equal to 400 g/mol, and mixtures thereof, and wherein said anti-hazing agent has a pKa of at least 8; and an effective amount of one or more detergent surfactants; wherein the weight ratio of said anti-hazing agent to said surfactants is from 40:1 to 1:5, preferably from 10:1 to 1:5, more preferably from 5:1 to 1:5; and said composition has a pH greater than 8, preferably greater than 9, more preferably from 9.5 to 12.5, more preferably from 9.5 to 11.7.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/10385

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 99 18182 A (PROCTER & GAMBLE) 15 April 1999 (1999-04-15) page 8, paragraph 2 - paragraph 3 page 9, paragraph 1 - paragraph 3; claims 1,8-10	1,2,6-8, 10-12
A	EP 0 527 625 A (SQUIBB BRISTOL MYERS CO) 17 February 1993 (1993-02-17) page 2, line 1 - line 17; examples 1,8	1,9-12
A	US 4 486 329 A (JACQUES ALAIN ET AL) 4 December 1984 (1984-12-04) abstract; examples 6,7	1,9-12

INTERNATIONAL SEARCH REPORT

Information on patent family members

Internat Application No

PCT/US 00/10385

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9924539 A	20-05-1999	NONE	
WO 9911746 A	11-03-1999	AU 8699898 A EP 1009789 A	22-03-1999 21-06-2000
WO 9847993 A	29-10-1998	DE 19717329 A AU 7643798 A EP 0977825 A	29-10-1998 13-11-1998 09-02-2000
EP 0372610 A	13-06-1990	DE 3841134 A BR 8906274 A CA 2004762 A JP 2213486 A	13-06-1990 21-08-1990 07-06-1990 24-08-1990
WO 9918182 A	15-04-1999	AU 9674898 A EP 1019475 A NO 20001735 A	27-04-1999 19-07-2000 30-05-2000
EP 0527625 A	17-02-1993	AU 653617 B AU 2085192 A CA 2075168 A,C DE 69225033 D DE 69225033 T ES 2117034 T HK 1004780 A JP 5302099 A MX 9204561 A NZ 243831 A US 5750482 A ZA 9205727 A	06-10-1994 11-02-1993 10-02-1993 14-05-1998 30-07-1998 01-08-1998 04-12-1998 16-11-1993 01-02-1993 26-10-1994 12-05-1998 10-03-1993
US 4486329 A	04-12-1984	AT 394204 B AT 329684 A AU 567770 B AU 3440484 A BE 900828 A CA 1231879 A CH 662581 A DE 3437086 A DK 496684 A,B, FR 2553431 A GB 2148319 A,B GR 80665 A IE 57734 B IT 1178142 B MX 161953 A NO 844130 A,B, SE 459815 B SE 8405151 A ZA 8407851 A	25-02-1992 15-08-1991 03-12-1987 26-04-1985 16-04-1985 26-01-1988 15-10-1987 02-05-1985 18-04-1985 19-04-1985 30-05-1985 20-02-1985 24-03-1993 09-09-1987 08-03-1991 18-04-1985 07-08-1989 18-04-1985 28-05-1986

THIS PAGE BLANK (USPTO)